

*An Account of an Apparatus on a peculiar Construction for performing Electro-magnetic Experiments.* By W. H. Pepys, Esq. F.R.S. Read April 10, 1823. [*Phil. Trans.* 1823, p. 187.]

This instrument consists of two plates, each fifty feet long and two wide, one of copper and the other of zinc. They are rolled round a cylinder of wood, and their contact is prevented by the interposition of hair rope and notched sticks. This coil is counterpoised and suspended by a rope and pulleys over a tub of acid, into which it is immersed when required for use. When thus immersed, with its poles connected by a sufficient conductor, it affected magnetic needles at a distance of five feet, and was extremely powerful in conferring magnetism upon steel bars, which acquire a north polarity at the copper, and a south at the zinc plate. The electric intensity of the apparatus is exceedingly feeble.

*On the Condensation of several Gases into Liquids.* By Mr. Faraday, Chemical Assistant in the Royal Institution. Communicated by Sir Humphry Davy, Bart. P.R.S. Read April 10, 1823. [*Phil. Trans.* 1823, p. 189.]

The gases which the author has succeeded in condensing into the liquid form, are, the sulphurous acid, sulphuretted hydrogen, carbonic acid, euchlorine, nitrous oxide, cyanogen, ammonia, muriatic acid, and chlorine. The process by which they were condensed, consisted in liberating them from certain of their compounds in small glass tubes, hermetically sealed and bent, so that when required, the end might answer the purpose of a receiver, and be occasionally immersed in ice or freezing mixtures. They generally appear as exceedingly limpid, colourless, and mobile fluids, and assume the gaseous form with various degrees of rapidity and violence upon the removal of that pressure by which they had been previously restrained.

In this paper Mr. Faraday details the particular method to which he resorted for obtaining each of these liquid bodies, and describes such of their characters as his experiments have hitherto enabled him to determine.

Liquid sulphurous acid appears to exert a pressure of about 2 atmospheres, at 45°. The pressure of the vapour of sulphuretted hydrogen was equal to about 13 atmospheres, at 32°; that of carbonic acid to 40 atmospheres, at 45°; of nitrous oxide 48 atmospheres, at 50°; of cyanogen between 3 and 4 atmospheres, at 45°; of muriatic acid 28 atmospheres, at 32°.

The author's attempts to obtain hydrogen, oxygen, fluoric, fluosilicic, and phosphuretted hydrogen gases in the form of liquids, have hitherto been without success.